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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/819,772	03/28/2001	Michael Petrov	02509/90	2624

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EXAMINER	
CUNNINGHAM, GREGORY F	
ART UNIT	**PAPER NUMBER**
2676	8

DATE MAILED: 06/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/819,772	PETROV ET AL.	
	Examiner	Art Unit	
	Greg Cunningham	2676	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 June 2004* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-114* is/are pending in the application.

4a) Of the above claim(s) *11-53 and 64-112* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10,54-64,113 and 114* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 March 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. This action is responsive to communications of application filed 3/28/2001.

2. The disposition of the claims is as follows: claims 1-114 are pending in the application. Claims 1-10, 54-63, 113 and 114 have been elected, the remaining claims 11-53 and 64-112 have been withdrawn from consideration. Claims 1, 5, 54, 58 and 113 are independent claims.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 114 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Claim 114 recites the limitation "method of claim 113" in first line. There is insufficient antecedent basis for this limitation in the claim.

(Examiner's note: claim 114 will been examined as though it read "system of claim 113".)

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

7. Claims 1-7 are rejected under 35 U.S.C. 102(a) as being disclosed by Dimsdale, US Patent Number 6,420,698.

A. Per claim 1, "1. A method for managing operations performed on a three dimensional mesh model comprising: storing a copy of the initial state of the three dimensional mesh model; receiving a request to perform an operation on the three dimensional mesh model; storing a record of the request in an ordered list; and performing the operation on the three dimensional mesh model." is disclosed in col. 25, lns. 1-24 at "(145) In one preferred embodiment, the CGP 40 can contain many geometric primitives that can be used to simulate the actual surfaces of the objects scanned. The geometric primitives include any number of standard graphics primitives, such as triangulated meshes, planes, cylinders, spheres, torii, lines, and points. The simplest form of geometry fitting involves using a triangulated mesh to connect the scan points to show the surface features of the objects scanned. The scan cloud 1810 in FIG. 18 can be meshed 2310 and rendered as shown in FIG. 23. Since the scan data are acquired in a regular grid, it is simple to create a triangular mesh by connecting neighboring points. The user can also set discontinuity tolerances in depth and angle to avoid meshing adjacent points separated by more than the specified threshold. Breaking the mesh in this way provides a more realistic looking surface, referred to as a shrinkwrap surface, because artificial mesh surfaces at occlusion edges do not occur. A wide variety of known mesh operations can be applied to the resulting mesh, such as smoothing (noise reduction) and mesh simplification (to reduce the mesh density in smooth areas that do not require a fine mesh grid). Mesh vertices may also be colored with information such as intensity."

and in col. 41, ln. 60 – col. 42, ln. 11 at "(275) Undo Module (276) The undo module encapsulates the run time history of a user with a geometric database. The undo module records a stack of actions necessary to undo operations in the reverse order in which they were performed by a user. Each undo -able tool in the Tool Module will provide a call with operands which when run will reverse the actions of that tool. (277) The undo module provides functionality to: Store the `undo ` calls and operands Apply these `undo ` calls when requested and generate a `redo` stack (278) The undo module interacts closely with the Tool Module as each undo -able tool must provide appropriate calls to the undo module. The undo module, while interacting closely with the Database Module, does not stores its data in the database module because it records a session with a user rather than information required in the geometric model."

B. Per claim 2, "The method of claim 1 wherein the storing a record of the request step includes: storing all of the parameters necessary to repeat the operation." is disclosed supra for claim 1, particularly at "The undo module records a stack of actions necessary to undo operations in the reverse order in which they were performed by a user."

C. Per claim 3, "The method of claim 2 wherein the ordered list contains a record for each operation that has been previously performed on the three dimensional mesh model in the order in which it was performed." is disclosed supra for claim 1, particularly at "Each undo -able tool in the Tool Module will provide a call with operands which when run will reverse the actions of that tool. (277) The undo module provides functionality to: Store the `undo ` calls and operands".

D. Per claim 4, "The method of claim 3 further comprising: retrieving the stored copy of the three dimensional mesh model; retrieving the ordered list of requests; and performing each

operation in the ordered list of requests on the retrieved copy of the three dimensional mesh model." is disclosed supra for claim 1, particularly at ") The undo module provides functionality to: Store the `undo ` calls and operands Apply these `undo ` calls when requested and generate a `redo` stack (278) The undo module interacts closely with the Tool Module as each undo -able tool must provide appropriate calls to the undo module."

and in col. 40, lns. 44-57 at "(259) The database module encapsulates storage and retrieval of the data generated by the application. It should provide rapid access to that data, whether it is stored on disk or in memory, in a transparent manner. This module should be designed to permit a client/server module in which multiple clients operate on the same database. (260) A scheme for checking out objects to be used by an operation seems necessary as well as some form of caching (assuming that disk support for the database is provided). The database should provide a general structure upon which a spatial hierarchy can be imposed for more efficient operation. A structural hierarchy and instancing should also be provided."

E. Per claim 5, "A method for restoring a previous version of a three dimensional mesh model comprising: retrieving a stored copy of the three dimensional mesh model; retrieving an ordered list of operation requests; and performing each operation in the ordered list of operation requests on the retrieved copy of the three dimensional mesh model." is disclosed supra for claim 1, particularly at ") The undo module provides functionality to: Store the `undo ` calls and operands Apply these `undo ` calls when requested and generate a `redo` stack (278) The undo module interacts closely with the Tool Module as each undo -able tool must provide appropriate calls to the undo module."

and in col. 40, lns. 44-57 at "(259) The database module encapsulates storage and retrieval of the data generated by the application. It should provide rapid access to that data, whether it is stored on disk or in memory, in a transparent manner. This module should be designed to permit a client/server module in which multiple clients operate on the same database. (260) A scheme for checking out objects to be used by an operation seems necessary as well as some form of caching (assuming that disk support for the database is provided). The database should provide a general structure upon which a spatial hierarchy can be imposed for more efficient operation. A structural hierarchy and instancing should also be provided."

F. Per claim 6, "The method of claim 5 wherein each operation is performed in the same order in which it was originally placed in the ordered list." is disclosed supra for claim 1 and in col. 41, lns. 62-64 at "The undo module records a stack of actions necessary to undo operations in the reverse order in which they were performed by a user."

G. Per claim 7, "The method of claim 6 further comprising the step of: rendering the retrieved copy of the three dimensional mesh model to a display device after each operation is performed." is disclosed supra for claim 6 and in col. 24, lns. 2-4 at "The CGP 40 lets the user interactively change the 3-D view of the data while the data is arriving to get a better idea of the spatial layout of the data." and in col. 45, lns. 54-57 at "(316) Visualization 9. At any time during the data gathering or modeling process, the existing geometrical data can be viewed interactively either in a "crystal-ball/model-in-hand" paradigm or in a "walk-through" mode."

H. Per independent claims 54 and 58, these are directed to a article of manufacture for performing the method of independent claims 1 and 5, respectively, and therefore are rejected to independent claims 1 and 5.

I. Per dependent claims 55-57 and 59-63, these are directed to a article of manufacture for performing the method of dependent claims 2-4 and 6-10, respectively, and therefore are rejected to dependent claims 2-4 and 6-10.

J. Per independent claim 113, this is directed to a system for performing the method of independent claim 1, and therefore is rejected to independent claim 1.

K. Per dependent claim 114, this is directed to a system (not method – see 112 supra) for performing the method of dependent claim 2, and therefore is rejected to dependent claim 2.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dimsdale, US Patent Number 6,420,698, as applied to claims 6, above, and further in view of Fujita et al. (US Patent Number 5,850,223), hereafter Fujita.

A. Per claim 8, "The method of claim 6 wherein the ordered list of operations is filtered to exclude at least one record." is disclosed by Dimsdale supra for claim 6. However, Dimsdale does not appear to disclose "wherein the ordered list of operations is filtered to exclude at least one record.", but Fujita does in col. 12, lns. 23-42 at "(58) FIGS. 19A to 19D are views showing a shape as it changes during configuration editing. In FIGS. 19A to 19D, solid arrows indicate one editing and dotted arrows indicate one undo processing. In a first state shown in

FIG. 19A, a quadrilateral which has four vertexes (V0, V1, V2, V3) is defined. In a second state shown in FIG. 19B, a tetrahedron is defined with deleting the vertex V0 from and adding a new vertex V4 to the first state. Since the vertex V0 is deleted, information defining the connection of the vertexes are updated and the vertexes V1 and V3 become vertexes V1a and V3a, respectively.

(59) In a third state shown in FIG. 19C, a pentahedron is defined by adding vertexes V5 and V6 to the second state and the vertex V4 is changed to a vertex V4a by changing the position of the vertex V4. In a fourth state shown in FIG. 19D, the shape in the second state is restored as a result of undo processing on the third state. If undo processing is performed again from the fourth state, the shape returns to the condition of the third state."

Whereby the undo process is limited to the previous edited state, all other previous states are eliminated (filtered).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply ordered lists of undo disclosed by Dimsdale in combination with limited undo commanding disclosed by Fujita, and motivated to combine the teachings because Fujita provides a scaled down version of Dimsdale undo feature.

B. Per claim 9, "The method of claim 8 wherein the at least one excluded record is at the end of the list" is disclosed by Dimsdale and Fujita supra for claim 8. However, Dimsdale does not appear to disclose "wherein the at least one excluded record is at the end of the list", but Fujita does in col. 5, lns. 27-33 and/or col. 12, lns. 9-15.

Whereby the undo process is limited to the previous edited state, all other previous states are eliminated (filtered) and resulting in end of list.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply ordered lists of undo disclosed by Dimsdale in combination with limited undo commanding and end of list disclosed by Fujita, and motivated to combine the teachings because Fujita provides a scaled down version of Dimsdale undo feature.

C. Per claim 10, "The method of claim 8 wherein the at least one excluded record is at least one record removed from an end of the list" is disclosed by Dimsdale and Fujita supra for claim 8. However, Dimsdale does not appear to disclose "wherein the at least one excluded record is at least one record removed from an end of the list", but Fujita does in col. 12, lns. 9-15.

Whereby the undo process is limited to the previous edited state, all other previous states are eliminated (filtered) and resulting in end of data cells 200 "record".

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply ordered lists of undo disclosed by Dimsdale in combination with limited undo commanding and end of data cells disclosed by Fujita, and motivated to combine the teachings because Fujita provides a scaled down version of Dimsdale undo feature.

Citation of Pertinent Prior Art

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

U. S. Patent No.	Issued	Class	Applicant(s)
US 20010056308 A1	20011227	700/98	Petrov, Michael et al.
US 5555366 A	19960910	711/169	Teig, Steven L. et al.

Responses

11. Responses to this action should be mailed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231. If applicant desires to fax a response, (703) 308-9051 may be used for formal communications or (703) 308-6606 for informal or draft communications.

Please label "PROPOSED" or "DRAFT" for informal facsimile communications. Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).

Inquiries

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Greg Cunningham whose telephone number is (703) 308-6109.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella, can be reached on (703) 308-6829.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

J.F. Cunningham

gfc

June 21, 2004

Matthew C. Bella

MATTHEW C. BELLA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600